

   #groupivphotonics2019

GFP 2019

GROUP IV PHOTONICS

Workshop: 27 August
Technical Sessions: 28-30 August
Hilton Singapore, Singapore



FINAL PROGRAM

Conference Co-Chairs

Chuan Seng Tan,
Nanyang Technological University,
Singapore

Jason Liow
Rain Tree Photonics & Institute of Microelectronics,
A*STAR,
Singapore

www.IEEE-GFP.org



Welcome to the 16th International Conference on Group IV Photonics in Singapore at the Hilton Singapore

The Group IV Photonics Conference (GFP 2019), now in its 16th year, delivers insights on current and future innovations in Group IV element-based photonic materials and devices, including silicon photonics, as well as other integration and fabrication technologies. Scheduled as a single-track conference, GFP 2019 facilitates personal interaction between colleagues, including oral and poster sessions of contributed and invited papers, as well as a plenary session with overviews of important Group IV element photonics topics.

Chuan Seng Tan
Nanyang Technological University
Conference Co-Chairs



Jason Liow
Rain Tree Photonics & Institute of
Microelectronics, A*STAR
Conference Co-Chairs



GROUP IV PHOTONICS CONFERENCE 2019 Program-at-a-Glance

TUESDAY, 27 AUGUST	WEDNESDAY, 28 AUGUST	THURSDAY, 29 AUGUST	FRIDAY, 30 AUGUST
Registration: Ballroom Foyer Tuesday, 27 August- 11:00 am-5:00 pm Wednesday, 28 August- 7:00 am-6:00 pm Thursday, 29 August- 7:30 am-5:30 pm Friday, 30 August- 7:30 am-4:00 pm	8:00 am-10:00 am WA: Novel Light Sources Session Chair: C.S.Tan	8:00 am-10:00 am ThA: Advances in Novel Devices Session Chair: Y. Huang	8:00 am-10:00 am FA: Novel Materials Session Chair: G. Chang
	10:00 am-10:30 am EXHIBITS/COFFEE BREAK: VISTA ROOM		
12:00 pm-1:00 pm LUNCH BREAK (PROVIDED) Opus Grill (lobby level)	10:30 am-12:00 pm WB: Integration Platforms and Reliability Session Chair: K. Yamada	10:30 am-12:00 pm ThB: Photonic Circuits and Other Concepts Session Chair: X. Luo	10:30 am-12:00 pm FB: Photodetectors Session Chair: Z. Huang
	12:00 pm-1:30 pm LUNCH BREAK (PROVIDED): VISTA ROOM		
1:00 pm-5:00 pm TuA: Pre-GFP PIC Design Workshop Ballroom II <i>*Coffee breaks will be set at the Ballroom Foyer outside of the Ballroom II</i>	1:30 pm-3:30 pm WC: Silicon Nitride Devices and Platforms Session Chair: D. Tan	1:30 pm-3:30 pm ThC: Novel Applications Session Chair: H. Rong	1:30 pm-3:30 pm FC: MOS-based Modulators Session Chair: W. Bogaerts
	3:30 pm-4:00 pm EXHIBITS/COFFEE BREAK: VISTA ROOM		
	3:30 pm-5:00 pm WP: Poster Session Session Chair: J. Liow Vista Room	4:00 pm-5:00 pm ThD: Panel Session Session Chair: R. Blum	4:00 pm-5:30 pm FD: Mid-Infrared Devices and Platforms Session Chair: D. Nam
	5:00 pm-6:30 pm WD: Photonics Crystal Devices Session Chair: A. Wang	5:00 pm-6:00 pm Welcome Reception Vista Room	ALL GENERAL SESSIONS TO BE HELD IN GRAND BALLROOM

28th August 2019

8:00am

Grand Ballroom

WA: Novel Light Sources

Prof. Chuan Seng Tan (*Nanyang Technological University*)

8:00am-8:45am - WA1 - Group-IV Laser Sources – Review, Prospects and Challenges (Plenary)

Hans Sigg¹ (1. Paul Scherrer Institut)

8:45am-9:15am - WA2 - Quantum Dot Lasers Integrated on Silicon (Invited)

Yasuhiko Arakawa¹, Takahiro Nakamura², Jinkwan Kwoen¹ (1. The University of Tokyo, 2. PETRA)

9:15am-9:30am - WA3 - GeSn Lasers with Uniaxial Tensile Strain in the Gain Medium

Jérémie Chrétien¹, Nicolas Pauc¹, Francesco Taro Armand Pilon³, Mathieu Bertrand⁴, Quang-Minh Thai¹, Lara Casiez⁴, Rami Khazaka⁴, Hans Sigg³, Jérôme Faist⁹, Alexei Chelnokov⁴, Vincent Reboud⁴, Jean-Michel Hartmann⁴, Vincent Calvo¹ (1. Univ. Grenoble Alpes, CEA, IRIG-DePhy, 2. Paul Scherrer Institut, 3. CEA LETI, 4. Institute for Quantum Electronics, ETH Zürich)

9:30am-9:45am - WA4 - Ultra-low Threshold CW Lasing in Tensile Strained GeSn Microdisk Cavities

Moustafa El Kurdi¹, Anas Elbaz², Nils Von den Driesch³, Konstantin Pantzas², Gilles Patriarche², Etienne Herth², Sebastien Sauvage², Xavier Checoury², Isabelle Sagnes², Jean-Michel Hartmann¹⁰, Zoran Ikonic¹¹, Frederic Boeuf¹², Philippe Boucaud¹³, Detlev Grützmacher³, Dan Buca³ (1. C2N CNRS-Université Paris sud, 2. C2N CNRS/UPSud, 3. FZI, 4. CEA LETI, 5. University LEEDS, 6. STMICROELECTRONICS, 7. CRHEA CNRS)

9:45am-10:00am - WA5 - Strained Germanium Lasing in the Mid-Infrared

Francesco Taro Armand Pilon¹, Alexey Lyasota¹, Yann-Michel Niquet³, Vincent Reboud⁴, Vincent Calvo³, Nicolas Pauc³, Julie Widiez⁴, Christopher Bonzon⁸, Jean-Michel Hartmann⁴, Alexei Chelnokov⁴, Jérôme Faist¹¹, Hans Sigg¹ (1. Paul Scherrer Institut, 2. Univ. Grenoble Alpes, CEA, IRIG-DePhy, 3. Univ. Grenoble Alpes, CEA, LETI, 4. Institute for Quantum Electronics, ETH Zürich, 5. Institute for Quantum Electronics, ETH Zürich)

28th August 2019

10:00am

Vista Room

EXHIBITS/COFFEE BREAK

28th August 2019

10:30am

Grand Ballroom

WB: Integration Platforms and Reliability

Dr. Koji Yamada (*National Institute of Advanced Industrial Science and Technology*)

10:30am-11:00am - WB1 - Large Scale Field Programmable Photonic Arrays (Invited)

Jose Capmany¹, Prometheus DasMahapatra², Daniel Pérez Pérez López² (1. Polytechnic University of Valencia, 2. Universitat Politècnica de Valencia)

11:00am-11:15am - WB2 - Micro-transfer-printed III-V-on-silicon C-band Distributed Bragg Reflector Laser

Jing Zhang¹, Sulakshna Kumari¹, Sören Dhoore¹, Grigorij Muliuk¹, Agnieszka Gocalinska⁵, Emanuele Pelucchi⁶, Brian Corbett⁵, Gunther Roelkens¹ (1. Gent University-imec, 2. Tyndall National Institute)

11:15am-11:30am - WB3 - Toward Monolithic Optoelectronic Integration of GeSn Photodiode and FinFET on GeSnOI Platform

Shengqiang Xu¹, Yi-Chiau Huang², Dian Le³, Saeid Masudy-Panah³, Xiao Gong³, Yee-Chia Yeo³ (1. National University of Singapore, 2. Applied Materials Inc., 3. National University of Singapore)

11:30am-11:45am - WB4 - High Resolution Silicon Nitride Spectrometer by Integrating Micro-rings and Arrayed Waveguide Gratings in Tandem

Zunyue Zhang¹, Yi Wang¹, Hon TSANG³ (1. The Chinese University of Hong Kong, 2. Chinese University of Hong Kong)

11:45am-12:00pm - WB5 - Reliability of CMOS-compatible Ti / n-InP and Ti / p-InGaAs Ohmic Contacts for Hybrid III-V / Si Lasers

Flore Boyer¹, Christophe Jany¹, Jérémy Da Fonseca¹, Bertrand Szelag¹, Vincent Amalbert¹, Magali Grégoire⁶, Quentin Raffay⁷, Philippe Rodriguez¹ (1. CEA LETI, 2. STMicroelectronics, 3. Grenoble INP)

28th August 2019

12:00pm

Vista Room

LUNCH BREAK (PROVIDED)

28th August 2019

1:30pm

Grand Ballroom

WC: Silicon Nitride Devices and Platforms

Dr. Dawn Tan (*Singapore University of Technology and Design*)

1:30pm-2:00pm - WC1 - Automatic Tuning and Locking of Hitless Add-Drop Filters (Invited)

Andrea Melloni¹, Mazyar Milanizadeh¹, Douglas Aguiar¹, Matteo Petrini¹, Emanuele Guglielmi¹, Francesco Zanetto¹, Fabio Toso¹, Francesco Morichetti¹ (1. Politecnico di Milano)

2:00pm-2:30pm - WC2 - Towards Ultra-high-capacity Optical Transmissions via Silicon Photonics (Invited)

Wei Shi¹ (1. Université Laval)

2:30pm-2:45pm - WC3 - UV-Light Generation In Silicon Nitride Resonators Pumped At Telecom Wavelengths

Houssein El Dirani¹, Ayman Nassar Kame², Marco Casale¹, Sébastien Kerdiles¹, Christelle Monat⁵, Xavier Letartre⁵, Carole Socquet-Clerc¹, Minhao Pu², Leif Katsuo Oxenløwe², Kresten Yvind², Jesper Lægsgaard², Corrado Sciancalepore¹ (1. CEA LETI, 2. DTU Fotonik, 3. Ecole Centrale de Lyon)

2:45pm-3:00pm - WC4 - Multilayer Silicon Nitride based Coupler Integrated into a Silicon Photonics Platform with 0.5 dB Coupling Loss between Standard SMF and the As-Diced Chip Edge Facet

Ravi Tummidi¹, Mark Webster¹ (1. Cisco Systems, Inc.)

3:00pm-3:15pm - WC5 - S-C-L Band Coarse Wavelength Division Multiplexing on Ultra Silicon Rich Nitride Platform

George Chen¹, Peng Xing¹, Hong Wei Gao¹, Ju Won Choi¹, Doris Keh Ting Ng⁵, Dawn Tan¹ (1. Singapore University of Technology and Design, 2. Institute of Microelectronics, Agency for Science, Technology and Research)

3:15pm-3:30pm - WC6 - Ultra Low-loss Silicon Waveguides for 200 mm Photonics Platform

Quentin Wilmart¹, Cyril Bellegarde², Camille Petit-Etienne², Laurene Youssef², Jean-Michel Hartmann¹, David Fowler¹, Stéphane Brisson¹, Stéphanie Garcia¹, André Myko¹, Karen Ribaud¹, Philippe Grosse¹, Benoit Charbonnier¹, Stéphane Bernabé¹, Corrado Sciancalepore¹, Erwine Pargon², Bertrand Szlag¹ (1. CEA LETI, 2. LTM-CNRS)

28th August 2019

3:30pm

Vista Room

EXHIBITS/COFFEE BREAK & WP: Poster Session

Jason Liow (*Institute of Microelectronics*)

The exhibits are from 3:30 pm-4:00 pm. The poster session is from 3:30 pm-5:00 pm.

WP1 - Mid-index Silicon Nitride Devices for Enhanced Linear and Non-linear Photonic Functionalities

Thalia Dominguez Bucio¹, Cosimo Lacava¹, Stefan Ilie¹, Ilias Skandalos¹, Greta De Paoli², Katarzyna Grabska¹, Ali Khokhar¹, Periklis Petropoulos¹, Frederic Gardes¹ (1. University of Southampton, 2. Università degli Studi di Padova)

WP2 - Multi Composition GeSi Tuneable Concentration Silicon-germanium Wire Structures for CMOS Photonics

Katarzyna Grabska¹, Mehdi Banakar¹, Thalia Dominguez Bucio¹, Milos Nedeljkovic¹, Callum Littlejohns¹, Frederic Gardes¹, Shinichi Saito¹, Giovanni Isella², Andrea Ballabio², Andrea Barzaghi² (1. University of Southampton, 2. Politecnico di Milano)

WP3 - Ultra Broadband Mid-infrared Ge-on-Si Polarization Rotator

Kevin Gallacher¹, Ross Millar¹, Ugne Griskeviciute¹, Douglas Paul¹ (1. University of Glasgow)

WP4 - Si₃N₄ Waveguide-Coupled Microdisk Resonators with a Quality Factor of 10⁷

Kaiyi WU¹, Andrew Poon² (1. The Hong Kong University of Science and Technology, 2. Hong Kong University of Science and Technology)

WP5 - Fabrication of Ultrasmall Silicon Waveguide Lenses Designed by Wavefront-Matching Method

Yusuke Sawada¹, Takeshi Fujisawa¹, Kunimasa Saitoh¹ (1. Hokkaido University)

WP6 - Design and Analysis of Tensile-Strained GeSn Mid-Infrared Photodetectors on Silicon

Guoen Chang¹, Munho Kim², Greg Sun³, H. H. Cheng⁴ (1. National Chung-Cheng University, 2. Nanyang Technological University, 3. University of Massachusetts Boston, 4. National Taiwan University)

WP7 - Characterization of Silicon Photonics Modulator Integration and High Efficiency Testing Platform

Shang-Chun Chen¹, Sin-Jhu Wun¹, Chi-Hsiang Hsu¹, Chen-Yu Lin¹, Jie Zhang¹, Kai-Ning Ku¹, Po-Chih Chang¹, Chung-Chih Wang¹, Wei-Yan Chen¹, Tai-Hsing Lee¹, Chien-Ying Huang¹, Ting-Hui Chen¹, Ming-Chang Lee^{1,3}, Chien-chung Lin¹ (1. ITRI, 2. National Tsing Hua University)

WP8 - Mid-infrared Aluminum Nitride on Insulator (AlN/OI) Platform

Bowei Dong¹, Xianshu LUO¹, Li Huang¹, Guo-Qiang Lo¹, Kah Wee Ang¹, Dim-Lee Kwong², Chengkuo Lee¹ (1. National University of Singapore, 2. Institute of Microelectronics)

WP9 - High-Speed Wireless Communication Using Beamforming by Optical Phased Array in Silicon

Rhee Hyun-Woo¹, Jong-Bum You² (1. KAIST, 2. NNFC (National Nanofab Center))

WP10 - Silicon Mode-selective Modulation Device for On-chip Optical Interconnect

Hao Jia¹, Shanglin Yang², Xin Fu², Ting Zhou², Lei Zhang², Lin Yang² (1. Lanzhou university, 2. Institute of Semiconductors, Chinese Academy of Sciences)

WP11 - Germanium Light Source for Wafer-Level Inspection

Yoshiho Maeda¹, Toru Miura¹, Shinji Matsuo³, Hiroshi Fukuda¹ (1. NTT Device Technology Labs, 2. NTT)

WP12 - Towards Transparent on-waveguide Electrical Circuits in SiN-photonic Platform

Aneesh Dash¹, P. R. Yasasvi Gangavarapu¹, Siddharth Nambiar¹, Vadivukkarasi Jeyaselvan¹, Viphretuo Mere¹, S. K. Selvaraja¹, A. K. Naik¹ (1. Indian Institute of Science)

WP13 - Multi-scale Electronic Structure Analysis of Direct-gap group-IV Alloys: Implications for Device Applications

Christopher Broderick¹, Edmond O'Halloran¹, Amy Kirwan¹, Michael Dunne¹, Daniel Tanner¹, Stefan Schulz¹, Eoin O'Reilly¹ (1. Tyndall National Institute)

WP14 - Wideband, Flat-top, SOI Filter Using an Apodized Sub-wavelength-grating Contra-directional Coupler

Han Yun¹, Mustafa Hammood¹, Lukas Chrostowski¹, Nicolas Jaeger¹ (1. The University of British Columbia)

WP15 - Sparse Optical Phased Array Design

Francis Smith¹, Wuxiucheng Wang¹, Hui Wu¹ (1. University of Rochester)

WP16 - Strain Property of Germanium Photonic Crystal Cavity on Silicon

Chulwon Lee¹, Kie Young Woo¹, Hyun Gyu Song¹, Daegwang Choi¹, Sunghan Choi¹, Yong-Hoon Cho¹ (1. KAIST)

WP17 - Near Infrared Absorption Enhancement of Graphene for High-responsivity Photodetection

Xiyuan Cao¹, Yijin Zhang¹, Yi Jin³, Aimin Wu¹ (1. Shanghai Institute of Microsystem and Information Technology, C.A.S., 2. Zhejiang University)

WP18 - Optical Kerr Nonlinearity of CMOS Compatible PECVD Deposited Si-rich-nitride (SRN)

Hui Cong¹, Qi FENG¹, Ting Wang³, Jianjun Zhang⁴ (1. Institute of Physics, 2. Institute of Physics, Chinese Academy of Sciences, 3. Institute of Physics, CAS)

WP19 - Spectral Broadening Enhancement in Graphene Integrated Si Waveguides

Qi FENG¹, Hui Cong¹, Wenqi We³, Ting Wang³, Jianjun Zhang⁵ (1. Institute of Physics, 2. Institute of Physics, Chinese Academy of Sciences, 3. Institute of Physics, CAS)

WP20 - Towards Mid-IR Germanium Defect Detector

Lauren Reid¹, Milos Nedeljkovic¹, Radan Slavik¹, Goran Mashanovich¹ (1. University of Southampton)

WP21 - Unidirectional Reflection at the Exceptional Points of a Microresonator Due to the Backscattering

Stefano Biasi¹, Fernando Ramiro-Manzano², Lorenzo Pavesi¹ (1. University of Trento, 2. University of Valencia)

WP22 - Optical Mode Convertor for Enhanced Sensitivity in Evanescent Field Absorption Chemical Sensors

Jones Arockiadoss¹, Nan Wang¹, Lennon Lee¹ (1. Institute of Microelectronics, Agency for Science, Technology and Research)

WP23 - A Millimeter Scale Long Waveguide Grating Antenna with High Directionality for Optical Phased Array

Qing Wang¹, Shuxiao Wang¹, Youhong Zeng³, Wei Wang⁴, Yan Ca⁵, Zhijuan Tu³, Wencheng Yue⁵, Qing Fang⁶, Mingbin Yu³ (1. Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences University of Chinese Academy of Sciences, 2. Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, 3. Shanghai Industrial μ Technology Research Institute, 4. Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, 5. Kunming University of Science and Technology Shanghai Industrial μ Technology Research Institute)

WP24 - Temperature-insensitive Polysilicon Mach-Zehnder Interferometer in Bulk CMOS

Cheng-Tse Tang¹, Yung-Jr Hung¹, Ming-Yung Jung¹, Tzu-Hsiang Yen¹ (1. National Sun Yat-sen University)

WP25 - Investigation of Resonant-cavity-enhanced GeSn Photodetectors in Short-wavelength Infrared Regime

Qimiao Chen¹, Wei Li¹, Kwang Hong Lee³, Yi-Chiau Huang⁴, Lin Zhang¹, Yiding Ling¹, Bongkwon Son¹, Hao Zhou¹, Chuan Seng Tan¹ (1. Nanyang Technological University, 2. Singapore-MIT Alliance for Research and Technology (SMART), 3. Applied Materials Inc.)

WP26 - High-performance Vertical Interlayer Coupler for Multilayer Silicon Nitride-on-silicon Photonic Platform

Xin Mu¹, Sailong Wu¹, Lirong Cheng¹, Xin Tu⁴, H. Y. Fu¹ (1. Tsinghua University, 2. China University of Geosciences)

WP27 - Broadband Optical Splitter through Phase Compensated Mach-Zehnder Directional Coupler

S Hsu¹, Chi-Ting Lin¹, Yi-Hsuan Tseng³ (1. National Taiwan University of Science and Technology, 2. National Institute of Advanced Industrial Science and Technology)

WP28 - Compact polarization beam splitter based on a 3-waveguide directional coupler with broad bandwidth performance

Dawei Wang¹, Yujie Hu¹, Zhijuan Tu³, Youhong Zeng³, Wencheng Yue³, Yan Ca³, Wei Wang⁷, Qing Fang⁸, Mingbin Yu³ (1. Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences. University of Chinese Academy of Sciences, 2. Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, 3. Shanghai Industrial μ Technology Research Institute, 4. Kunming University of Science and Technology)

WP29 - Proposal and Simulation of a Low Loss, Highly Efficient Monolithic III-V/Si Optical Phase Shifter

Younghyun Kim¹, Sanghyeon Kim¹, Yoojin Ban¹, Sebastien Lardenois¹, Didit Yudistira¹, Marianna Pantouvaki¹, Joris Van Campenhout¹ (1. IMEC)

WP30 - Tunable Slow-light in Silicon Photonic Subwavelength Grating Waveguides

Antoine Gervais¹, Philippe Jean¹, Wei Shi¹, Sophie LaRoche¹ (1. Université Laval)

WP31 - Development and Integration of Silicon Photonics Interposer for Quantum Computing System

Yu Dian Lim¹, Jing Tao¹, Peng Zhao¹, Anak Agung Alit Apriyana¹, Chuan Seng Tan¹ (1. Nanyang Technological University)

WP32 - Diffractive Spot Array Generator Based on Multi-Layer Thin-Film Stacks

STEPHEN BAGNALD¹, J. Michael Miller², Pavel Cheber³, Winnie N. Ye⁴ (1. LUMENTUM/Carleton University, 2. LUMENTUM, 3. NRC, 4. Carleton University)

WP33 - Linewidth Enhancement Factor and Optical Injection in a Hybrid-silicon Quantum Dot Comb Laser

Bozhang DONG¹, Alfred Sawadogo¹, Jianan Duan¹, Heming Huang⁴, Geza Kurczvei⁵, Di Liang⁵, Frédéric Grillo¹ (1. Télécom ParisTech, 2. Hewlett Packard)

WP34 - Strain-engineered Ge Embedded into Microresonators as an Active Media for Si Photonics

Dmitry Yurasov¹, Nikita Gusev¹, Sergey Dyakov³, Alexey Nezhdanov⁴, Alexey Novikov¹, Evgeny Skorokhodov¹, Valeriy Verbus⁷, Artem Yablonskiy¹, Zakhariy Krasil'nik¹ (1. Institute for Physics of Microstructures Russian Academy of Sciences, 2. Skolkovo Institute of Science And Technology, 3. Nizhny Novgorod State University, 4. National Research University Higher School of Economics)

WP35 - Silicon Mach-Zehnder Modulator for 120 Gbps PAM-4 and 200 Gbps 16-QAM Signal Generation

Lingchen Zheng¹, Sizhu Shao¹, Jincheng Dai¹, Gaolu Zhang¹, Yixiao Zhu⁵, Pengfei Wang⁵, Lei Zhang¹, Xin Fu¹, Fan Zhang⁵, Lin Yang¹ (1. Institute of Semiconductors, Chinese Academy of Sciences, 2. Peking University, Beijing)

WP36 - Dark Current Analysis of Vertical p-i-n Photodetectors on a Germanium-on-insulator Platform

Bongkwon Son¹, Yiding Lin², Kwang Hong Lee³, Chuan Seng Tan² (1. Nanyang Technological University, 2. Nanyang Technological University, Singapore-MIT Alliance for Research and Technology (SMART), 3. Singapore-MIT Alliance for Research and Technology (SMART))

WP37 - Light Emission Driven by Fano Resonances in Symmetry-Breaking Silicon Metasurface

Chengcong Cui¹, Shuai Yuan¹, Cheng Zeng¹, Jinsong Xia¹ (1. Huazhong University of Science and Technology)

WP38 - InAs QDs Monolithically Grown on CMOS Compatible Si (001) and SOI Platform with Strong Emission at 1300 nm and 1550 nm

Wenqi Wei¹, Ting Wang¹, Jianjun Zhang³ (1. Institute of Physics, Chinese Academy of Sciences, 2. Institute of Physics, CAS)

WP39 - Silicon Nitride Waveguiding for Prospective Technologies at the 2 μ m Waveband

Jia Xu Brian Sia¹, Wanjun Wang¹, Zhongliang Qiao¹, Xiang Li¹, Xin Guo¹, Jin Zhou¹, Callum Littlejohns⁷,

Zecen Zhang¹, Chongyang Liu¹, Graham Reed⁷, Hong Wang¹ (1. Nanyang Technological University, 2. University of Southampton)

28th August 2019

5:00pm

Grand Ballroom

WD: Photonics Crystal Devices

Alan Wang (*Oregon State University*)

5:00pm-5:30pm - WD1 - Photonic-Crystal Lasers for Society 5.0 (Invited)

Susumu Noda¹ (1. Kyoto University)

5:30pm-5:45pm - WD2 - Temperature Characteristics of Photonic-Crystal Lasers Coupled to Si Waveguides

Koji Takeda¹, Takuro Fujii¹, Hidetaka Nishi¹, Eiichi Kuramochi², Akihiko Shinya⁴, Masaya Notomi⁴, Tai Tsuchizawa¹, Takaaki Kakitsuka¹, Shinji Matsuo¹ (1. NTT Device Technology Labs, 2. NTT Basic Research Labs)

5:45pm-6:00pm - WD3 - Photoluminescence Enhancement Phenomena in Photonic Crystal Slabs Formed on Si Structures with the Self-assembled Ge Nanoislands

Margarita Stepikhova¹, Dmitry Yurasov¹, Artem Yablonskiy¹, Sergey Sergeev⁴, Oleh Yermakov⁵, Sergey Dyakov⁶, Evgeny Skorokhodov¹, Alexey Novikov¹, Zakhariy Krasil'nik¹ (1. Institute for Physics of Microstructures Russian Academy of Sciences, 2. Institute for Physics of Microstructures Russian Academy of Sciences, 3. ITMO University, 4. Skolkovo Institute of Science And Technology)

6:00pm-6:15pm - WD4 - Integrated Photonic Physical Unclonable Function Using Highly Nonlinear Amorphous Silicon

Jasper Stroud¹, Neil MacFarlane¹, A Brinton Cooper¹, Mark Foster¹, Amy Foster¹ (1. Johns Hopkins University)

6:15pm-6:30pm - WD5 - Sub-decibel Off-chip Fiber Couplers Based on L-shaped Waveguides and Subwavelength Grating Metamaterials

Daniel Benedikovic¹, CARLOS RAMOS², Sylvain Guerber³, Diego Perez-Galacho⁴, Xavier Le Roux³, Vladyslav Vakarin⁶, Guillaume Marcaud³, Pavel Cheber⁸, Delphine Marris-Morin⁹, Eric Cassan¹⁰, Charles Baudot¹¹, Frederic Boeuf¹¹, Laurent Vivien¹³ (1. Centre, 2. Centre for Nanoscience and Nanotechnology, 3. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, C2N, 4. ITEAM Research Institute, Universitat Politècnica de València, 5. IMEC, 6. NRC, 7. C2N CNRS-Université Paris Sud, Université Paris Saclay, 8. C2N CNRS-Université Paris sud, 9. STMicroelectronics, 10. C2N)

29th August 2019

8:00am

Grand Ballroom

ThA: Advances in Novel Devices

Ying Huang (*Rain Tree Photonics*)

8:00am-8:30am - ThA1 - Nonlinear Integrated Photonics in Hydrogenated Amorphous Silicon (Invited)

Amy Foster¹ (1. Johns Hopkins University)

8:30am-9:00am - ThA2 - High-rejection Silicon Bragg Filters for Integrated Quantum Photonics (Invited)

Dorian Oser¹, Xavier Le Roux¹, Florent Mazeas³, Diego Perez-Galacho⁴, Daniel Benedikovic⁵, Elena Durán-Valdeiglesias¹, Vladyslav Vakarin¹, Olivier Alibert³, Pavel Cheben⁹, Sébastien Tanzilli¹⁰, Laurent Labonte³, Delphine Marris-Morini¹, Eric Cassan^{1,3}, Laurent Vivien¹, CARLOS RAMOS¹ (1. C2N CNRS-Université Paris Sud, Université Paris Saclay, 2. Institut de Physique de Nice, Université Côte d'Azur, CNRS, 3. ITEAM Research Institute, Universitat Politècnica de València, 4. Centre for Nanoscience and Nanotechnology, 5. NRC, 6. Institut de Physique de Nice, Université Côte d'Azur, CNRS, 7. C2N CNRS-Université Paris sud)

9:00am-9:15am - ThA3 - Ultra-Broadband Polarization-Independent Silicon Beam Splitter Based on Modal and Symmetry Engineering

David González-Andrade¹, Christian Lafforgue², Elena Durán-Valdeiglesias³, Xavier Le Roux³, Mathias Berciano³, Eric Cassan³, Delphine Marris-Morini³, Aitor V. Velasco¹, Pavel Cheben⁹, Laurent Vivien³, Carlos Alonso-Ramos³ (1. Consejo Superior de Investigaciones Científicas (CSIC), 2. École Normale Supérieure Paris-Saclay, Université Paris-Saclay, 3. C2N CNRS-Université Paris Sud, Université Paris Saclay, 4. National Research Council Canada (NRC))

9:15am-9:30am - ThA4 - High-Speed Plasmonic-Conductive Oxide-Silicon Modulator by Epsilon-near-zero Electro-Absorption

Erwen Li¹, Bokun Zhou¹, Yunfei Bo¹, Alan Wang¹ (1. Oregon State University)

9:30am-9:45am - ThA5 - Novel Integration Approach for III-V Microdisk Cavities on Si

Svenja Mauthe¹, Noelia Vico Triviño¹, Yannick Baumgartner¹, Philipp Staudinger¹, Preksha Tiwari¹, Marilyne Sousa¹, Daniele Caimi¹, Thilo Stöferle¹, Heinz Schmid¹, Kirsten Moselund¹ (1. IBM Research - Zurich)

9:45am-10:00am - ThA6 - Low-Loss Silicon Technology for High-Q Bright Quantum Sources

Houssein El Dirani¹, Federico Andrea Sabattol², Francesco Garrisi², Camille Petit-Etienne⁴, Jean-Michel Hartmann¹, Erwine Pargon⁴, Christelle Monat⁷, Marco Liscidin², Matteo Gall², Daniele Bajon², Corrado Sciancalepore¹ (1. CEA LETI, 2. University of Pavia, 3. LTM-CNRS, 4. Ecole Centrale de Lyon)

29th August 2019

10:00am

Vista Room

EXHIBITS/COFFEE BREAK

29th August 2019

10:30am

Grand Ballroom

ThB: Photonic Circuits and Other Concepts

Dr. Xianshu LUO (*National University of Singapore*)

10:30am-11:00am - ThB1 - Deep Learning with Coherent Nanophotonic Circuits (Invited)

Yichen Shen¹ (1. yichen@lightelligence.ai)

11:00am-11:15am - ThB2 - Ion Implantation and Electrical Annealing for Trimming Silicon MZIs and Facilitating One-time Programmable Photonic Circuits

Xingshi Yu¹, Xia Chen¹, Milan Milosevic¹, Xingzhao Yan¹, Shinichi Saito¹, Graham Reed¹ (1. University of Southampton)

11:15am-11:30am - ThB3 - Automated Function Reconfiguration of Silicon Optical Modulator by Simulated Annealing Algorithm

Guangwei Cong¹, Noritsugu Yamamoto¹, Takashi Inoue¹, Makoto Okano¹, Yuriko Maegami¹, Morifumi Ohno¹, Koji Yamada² (1. AIST, 2. National Institute of Advanced Industrial Science and Technology)

11:30am-11:45am - ThB4 - Contra-directional Couplers as Pump Rejection and Recycling Filters for on-chip Photon-pair Sources

Abdelrahman Afifi¹, Mustafa Hammood¹, Nicolas Jaeger¹, Sudip Shekhar¹, Jeff Young¹, Lukas Chrostowski¹ (1. The University of British Columbia)

11:45am-12:00pm - ThB5 - 1550nm-Wavelength Metalens Demonstrated on 12-inch Si CMOS Platform

Qize Zhong¹, Yu Li¹, Ting Hu¹, Yuan Dong¹, Zhengji Xu¹, Dongdong Li¹, Nanxi Li¹, Yuan-Hsing Fu¹, Shiyang Zhu¹, Vladimir Bliznetsov¹, Qun Ying Lin¹, Navab Singh¹ (1. Institute of Microelectronics, Agency for Science, Technology and Research)

29th August 2019

12:00pm

Vista Room

LUNCH BREAK (PROVIDED)

29th August 2019

1:30pm

Grand Ballroom

ThC: Novel Applications

Haisheng Rong (*Intel*)

1:30pm-2:00pm - ThC1 - Brillouin Integrated Photonics for Optical Signal Processing (Invited)

Benjamin Eggleton¹, Yang Liu¹ (1. University of Sydney)

2:00pm-2:30pm - ThC2 - From Optical Communications to the Brain: Integrated 3D Silicon Photonics (Invited)

Joyce Poon¹ (1. Max Planck Institute of Microstructure Physics)

2:30pm-2:45pm - ThC3 - Enhanced Kerr Optical Nonlinearity of Waveguides Integrated with Graphene Oxide

Jiayang Wu¹, Yunyi Yang¹, Xingyuan Xu¹, Yang Qu¹, Linnan Jia¹, Yuning Zhang¹, Yao Liang¹, Sai Tak Chu⁸, Brent Little⁹, Roberto Morandotti¹⁰, Baohua Jia¹, david moss¹ (1. Swinburne University of Technology, 2. City University of Hong Kong, 3. Xi'an Institute of Optics and Precision Mechanics Precision Mechanics, 4. INRS - Énergie, Matériaux et Télécommunications)

2:45pm-3:00pm - ThC4 - Spectral Engineering of Photonic Filters Based on Mode Splitting in Self-coupled Silicon Nanowire Waveguides

Jiayang Wu¹, Tania Moein¹, Xingyuan Xu¹, Yuning Zhang¹, Yang Qu¹, Linnan Jia¹, Mengxi Tan¹, david moss¹ (1. Swinburne University of Technology)

3:00pm-3:15pm - ThC5 - Optical Fed Steerable Antenna via Integrated Photonics Devices for Applications of Small Satellite Communication Systems

Hong Cai¹, Shaonan Zheng², Jun Zou², Rakesh Reddy², Faeyz Karim Muhammad², A. Q. Liu², Navab Singh⁷ (1. Institute of Microelectronics, 2. Nanyang Technological University, 3. Institute of Microelectronics, Agency for Science, Technology and Research)

3:15pm-3:30pm - ThC6 - Silicon Photonics Polarization Filter with 60 dB Extinction Ratio for On-chip Gyroscope Application

Ming-Yung Jung¹, Yung-Jr Hung¹, Tzu-Hsiang Yen¹, Cheng-Tse Tang¹ (1. National Sun Yat-sen University)

29th August 2019

3:30pm

Vista Room

EXHIBITS/COFFEE BREAK

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4:00pm

Grand Ballroom

ThD: Panel Session

Robert Blum (*Intel*)

29th August 2019

5:00pm

Vista Room

Welcome Reception

30th August 2019

8:00am

Grand Ballroom

FA: Novel Materials

Prof. Guoen Chang (*National Chung-Cheng University*)

8:00am-8:30am - FA1 - Large-scale Silicon Photonics Switch for Energy-efficient Network (Invited)

Kazuhiro Ikeda¹, Keijiro Suzuki¹, Ryotaro Konoike¹, Shu Namiki¹, Hitoshi Kawashima¹ (1. National Institute of Advanced Industrial Science and Technology)

8:30am-8:45am - FA2 - Understanding the Sidewall Dependence of Loss for Ge-on-Si Waveguides in the Mid-infrared

Ugne Griskeviciute¹, Kevin Gallacher¹, Ross Millar¹, Iain MacGilp⁴, Douglas Paul¹ (1. Univeristy of Glasgow, 2. KELVIN NANOTECHNOLOGY LTD)

8:45am-9:00am - FA3 - Enhanced L-Band Optical Absorption in Ge Grown on Si-on-Quartz Substrate

Kyosuke Noguchi¹, Michiharu Nishimura², Yoshiyuki Tsusaka³, Junji Matsu³, Yasuhiko Ishikawa¹ (1. Toyohashi University of Technology, 2. The University of Tokyo, 3. University of Hyogo)

9:00am-9:15am - FA4 - Molecular Fingerprint Sensing Using Ge-on-Si Waveguides

Ross Millar¹, Ugne Griskeviciute¹, Kevin Gallacher¹, Leonetta Baldassarre⁴, Marc Sorel⁵, Michele Ortolani⁴, Douglas Paul¹ (1. Univeristy of Glasgow, 2. Sapienza University of Rome, 3. UNIVERSITY OF GLASGOW)

9:15am-9:30am - FA5 - Non-volatile Indium Tin Oxide Electro-optic Switch

Jorge Parra¹, Irene Olivares¹, Antoine Brimont¹, Pablo Sanchis¹ (1. Universitat Politecnica de Valencia)

9:30am-10:00am - FA6 - Si Photonic Crystal Beam Steering Device (Invited)

Toshihiko Baba¹ (1. Yokohama National University)

30th August 2019

10:00am

Vista Room

EXHIBITS/COFFEE BREAK

30th August 2019

10:30am

Grand Ballroom

FB: Photodetectors

Dr. Zhihong Huang (*Hewlett Packard Enterprise*)

10:30am-11:00am - FB1 - Silicon Based Photodetection in the Telecom Band (Invited)

Uriel Levy¹, Rivka Gherabli¹, Christian Frydendahl¹, Meir Grajower¹, Joseph Shappir¹ (1. HUJI)

11:00am-11:15am - FB2 - Germanium Photodetectors with more than 60-nm Absorption Coverage Extension and ~2× Quantum Efficiency Enhancement Across L-band

Yiding Lin¹, Danhao Ma², Ruitao Wen², Kwang Hong Lee⁴, Xin Guo¹, Jin Zhou¹, Hong Wang¹, Chuan Seng Tan¹, Jurgen Miche⁹ (1. Nanyang Technological University, 2. MIT, 3. Singapore-MIT Alliance for Research and Technology (SMART), 4. Massachusetts Institute of Technology)

11:15am-11:30am - FB3 - Geiger Mode Ge-on-Si Single-Photon Avalanche Diode Detectors

Jaroslav Kirdoda¹, Derek Charles Sydney Dumas¹, Kateryna Kuzmenko³, Peter Vines³, Zoe M. Greener³, Ross Millar⁶, Muhammad M. Mirza¹, Gerald S. Buller³, Douglas Pau⁶ (1. UNIVERSITY OF GLASGOW, 2. Heriot-Watt University, 3. Univeristy of Glasgow)

11:30am-11:45am - FB4 - High-speed Germanium Pin Photodiodes Integrated on Silicon-on-insulator Nanophotonic Waveguides

Daniel Benedikovic¹, Leopold Viro², Guy Aubin¹, Jean-Michel Hartmann⁴, Bertrand Szelag⁴, Farah Amar¹, Xavier Le Roux¹, Carlos Alonso-Ramos⁸, Paul Crozat¹, Delphine Marris-Morin⁸, Eric Cassan¹¹, Charles Baudot^{1,2}, Frederic Boeuf^{1,2}, Jean-Marc Fédéli², Christophe Kopp², Laurent Vivien⁸ (1. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, C2N, 2. University Grenoble Alpes and CEA, LETI, 3. CEA LETI, 4. C2N CNRS-Université Paris Sud, Université Paris Saclay, 5. C2N CNRS-Université Paris sud, 6. STMicroelectronics)

11:45am-12:00pm - FB5 - A Compact Circuit Model for Si-Ge Avalanche Photodiodes over a Wide Range of Gain

Binhao Wang¹, Zhihong Huang¹, Xiaoge Zeng¹, Wayne Sorin¹, Di Liang¹, Marco Fiorentino¹, Raymond Beausoleil¹ (1. Hewlett Packard Enterprise)

30th August 2019

12:00pm

Vista Room

LUNCH BREAK (PROVIDED)

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1:30pm

Grand Ballroom

FC MOS-based Modulators

Wim Bogaerts (*Ghent University*)

1:30pm-2:00pm - FC1 - Practical Metamaterial Photonics (Invited)

Robert Halir¹, Jose Manuel Luque-González¹, Alejandro Sánchez-Postigo¹, Alaine Herrero-Bermello⁴, David González-Andrade⁵, Abdelfettah Hadij-El-Houati¹, Jonas Leuermann⁷, Daniel Pereira-Martín¹, Alejandro Ortega-Moñux¹, Jiří Čtyroký¹⁰, Gonzalo Wangüemert-Pérez¹, Aitor V. Velasco¹², Marina Sánchez-Rodríguez¹, Jose de-Oliva-Rubio¹, Jens Schmid¹⁵, Jordi Soler Penades¹⁶, Milos Nedeljkovic¹⁶, Goran Mashanovich¹⁶, Pavel Cheben¹⁵, Íñigo Molina-Fernández¹ (1. University of Málaga, 2. Instituto de Óptica Daza de Valdés, Consejo Superior de Investigaciones Científicas (CSIC), 3. Instituto de Óptica Daza de Valdés, 4. Bionand Center for Nanomedicine and Biotechnology, 5. CAS, Institute of Photonics and Electronics, 6. Consejo Superior de Investigaciones Científicas (CSIC), 7. National Research Council Canada (NRC), 8. University of Southampton)

2:00pm-2:30pm - FC2 - Integrated Barium Titanate Photonic Devices (Invited)

Jean Fompeyrine¹, Felix Eltes¹ (1. IBM Research GmbH, Zurich Research Laboratory)

2:30pm-2:45pm - FC3 - III-V/Si MOS Capacitor Mach-Zehnder Modulator with Low Temperature Sensitivity

Tatsuro Hiraki¹, Takuma Aihara¹, Koji Takeda¹, Takuro Fujii¹, Takaaki Kakitsuka¹, Tai Tsuchizawa¹, Hiroshi Fukuda¹, Shinji Matsuo¹ (1. NTT Device Technology Labs)

2:45pm-3:00pm - FC4 - Gate Oxide Process for III-V / Si Hybrid MOS Capacitor Modulator

Stéphane Malhouitre¹, Valentin Ramez¹, Viviane Muffato¹, Yohan Désières¹, Karim Hassan¹ (1. Univ. Grenoble Alpes, CEA, LETI)

3:00pm-3:15pm - FC5 - High-Efficiency of Narrow-Width MOS Capacitor Type Si Optical Modulator with TM Mode Excitation

Junichi Fujikata¹, Shigeki Takahashi¹, Masataka Noguchi¹, Takahiro Nakamura¹ (1. PETRA)

3:15pm-3:30pm - FC6 - High Speed Silicon Capacitor Modulators for TM Polarisation

Weiwei Zhang¹, Bigeng Chen¹, Kapil Debnath³, Muhammad K. Husain¹, Ali Khokhar¹, Shenghao Liu¹, James Byers¹, Wei Cao¹, Martin Ebert¹, Jamie Dean Reynolds¹, Mehdi Banakar¹, Callum Littlejohns¹, Scott Reynolds¹, Ke Li¹, Frederic Gardes¹, Goran Mashanovich¹, Graham Reed¹, Shinichi Saito¹, David J. Thomson¹ (1. University of Southampton, 2. Indian Institute of Technology)

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3:30pm

Vista Room

EXHIBITS/COFFEE BREAK

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4:00pm

Grand Ballroom

FD: Mid-Infrared Devices and Platforms

Nam Donguk (*Nanyang Technological University*)

4:00pm-4:30pm - FD1 - InAs/GaAs Quantum Dots Laser on Patterned Si(001) for Si Photonics (Invited)
Jianjun Zhang¹ (1. Institute of Physics, CAS)

4:30pm-4:45pm - FD2 - Mid-Infrared Silicon Waveguide-Based Bolometer

Yangbo Wu¹, Zhibo Qu¹, Ahmed Osman¹, Wei Cao¹, Ali Khokhar¹, Jordi Soler Penades¹, Goran Mashanovich¹, Milos Nedeljkovic¹, Otto Muskens¹ (1. University of Southampton)

4:45pm-5:00pm - FD3 - Broadband Mid-IR on-chip Fourier-transform Spectrometer

Miguel Montesinos Ballester¹, Qiankun Liu¹, Carlos Alonso-Ramos³, Joan Manel Ramirez⁴, Vladyslav Vakarin⁵, Xavier Le Roux³, Jacopo Frigerio⁷, Enrico Talamas⁷, Andrea Ballabio⁷, Laurent Vivien³, Giovanni Isella⁷, Delphine Marris-Morin³ (1. C2N CNRS-Université Paris sud, 2. C2N CNRS-Université Paris Sud, Université Paris Saclay, 3. III-V Labs, 4. IMEC, 5. Politecnico di Milano)

5:00pm-5:15pm - FD4 - Mid-infrared GeSn-based LEDs with Sn Content up to 16%

Mathieu Bertrand¹, Nicolas Pauc², Quang-Minh Tha², Jérémie Chrétien⁴, Lara Casiez¹, Andrea Quintero⁶, Philippe Rodriguez¹, Rami Khazaka¹, Joris Aubin¹, Jean-Michel Hartmann¹, Alexei Chelnokov¹, Vincent Calvo², Vincent Reboud¹ (1. Univ. Grenoble Alpes, CEA, LETI, 2. Univ. Grenoble Alpes, CEA, IRIG-DePhy, 3. CEA/IRIG/DePhy, 4. C2N CNRS-Université Paris sud and CEA LETI)

5:15pm-5:30pm - FD5 - Coupled-resonator-induced-transparency on Germanium-on-insulator Mid-infrared Platform

Chong Pei Ho¹, Ziqiang Zhao¹, Qiang Li¹, Shinichi Takagi¹, Mitsuru Takenaka¹ (1. The University of Tokyo)